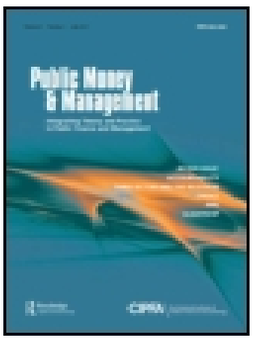
Valuing the project



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Valuing the project: a knowledge-action response to network governance in collaborative research

Peter L. Freeman and Andrew J. Millar

The delegation of research to self-directed networks is a relatively new strategy to focus academic endeavour on public priorities. Networks involve policy-makers, knowledge producers and knowledge users in unfamiliar governance and management relationships. Here we reflect, as practitioners, on research networks as complex governance systems and on their projects as knowledge-action systems designed to deliver public value. Projects represent the currency in which delegated research is issued, but their conversion into monetary grants and awards diverts attention from their potential as boundary organizations or communities of practice in the production of societal knowledge and understanding. Recognizing and supporting projects as scalable components of enduring knowledge-action systems, rather than as transient instances of research funding, is key to sustaining delivery of public value under conditions of network governance.

Keywords: Boundary organizations; collaborative research; communities of practice; complex governance systems; knowledge-action systems; networks.

The trajectory of public research in academic institutions is influenced by the policies put in place at different times by government or private sponsors seeking to focus research efforts on public priorities. Priorities include stimulation of 'knowledge economies' based on transfer of new knowledge to the private sector, and the development of more inclusive 'knowledge societies' that are secure in terms of health, wellbeing, food, energy, climate action and resource efficiency. The reflections that follow have been stimulated by our experiences as research practitioners charged with co-ordinating large policy-driven initiatives in regenerative medicine, biodiversity genomics, systems biology and population health. These enterprises, variously labelled as consortia, networks, platforms, projects, programmes, centres and institutes, have generally been initiated as co-operative partnerships, designed to align tranches of public money with the scientific interests of their participants. Few have gone beyond co-operation within and between 'hard' scientific disciplines, to become genuinely collaborative ventures that fully engage the 'soft' disciplines of social sciences and management or seek public participation in the research process. Although presumably successful at the level of the individual scientist, the impact of these enterprises on the 'grand challenges' that their project manifestos claim to address is difficult to evaluate. Our experiences have convinced us that there is an opportunity to better define and develop our practice as central actors (individuals, institutions and organizations) engaged in collaborative production of societal knowledge, in which scientists and other academics play an important, but not exclusive, role.

We take the position of reflective practitioners (Schön, 1983) and follow the advice of Christensen and Raynor (2003) in seeking out good *circumstance-contingent* theory to help frame our stewardship role in university-based science. Our reflections begin with a brief examination of the governance mechanisms that transform policy intent into research projects, including the assignment of projects to networks. We then discuss the relationship between networks and complex governance systems, reflecting in particular on the utility of policy action systems in the delivery of public programmes and projects. Next, we examine the management response to network

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governance, in the context of existing discourses of boundary organizations and knowledge-action systems. Finally, we present a synthesis of our reflections and conclusions.

Research governance and networks

Braun (2003) characterizes the relationship between government policy and science as one of delegation, in which policy-makers assign projects and funding, along with decision rights in their deployment, to the science system—that is, to scientists and their 'immediate institutions' (Rip, 1994). Decision rights are associated with governance, broadly understood as the mechanism through which a public or private governing body sets the goals, direction and limits of authority for their enterprise. Mechanisms through which policy-makers delegate project governance to the science system include traditional grant administration ('blind delegation' based on trust that science will produce what society needs) and 'delegation by contract' in which policy-makers set goals and performance levels which the science system is expected to achieve (Braun, 2003). Braun also notes the emergence of a model of 'delegation to networks', reflecting a policy intent to assign governance and management of research to collaborative networks involving both producers and users of knowledge.

Governance networks (Klijn and Skelcher, 2008) and collaborative governance (Ansell and Gash, 2008) are frequently discussed in the context of public administration, where governance is defined in terms of a broadening of government to include autonomous, self-organizing networks of non-state actors in deliberation and decision-making processes (Rhodes, 2007). Governance networks are also associated with the emerging political paradigm of public value management (Stoker, 2006), where 'public value' represents a societal outcome of balanced self-interest, public interest and perceived fairness (Talbot, 2011). Stoker (2006) sees 'networks of deliberation and delivery' as being central to the public value management approach, making it clear that networks provide both a deliberative (governance) stimulus and an executive (management) response in pursuit of public value. Discourses of network governance and public value management have not gained much traction in the world of academic research, at least within the scientific disciplines with which we are familiar. Public value may be seen as a 'downstream' result of research endeavours, while disciplinary governance is associated with static structures of authority and control rather than with open, deliberative network processes. We explore network governance in more depth in the next section.

Complex governance systems

The term 'network' is used to describe any system of interconnected entities. The entities of interest are depicted graphically as *nodes*, and the links between them as *edges*. Network science uses mathematical and statistical techniques to study network representations of complex systems and to develop predictive models of their behaviour. Networks are, in this context, no more than cartographic metaphors for the systems they represent, and we should therefore be able to deepen our understanding of governance networks by exploring their underlying governance systems. For the purposes of our discussion, we consider a system as a complex whole 'whose properties are not fully explained by an understanding of its component parts' (Gallagher and Appenzeller, 1999). Research on complex systems* is pursued in fields as diverse as biology, physics, public administration, philosophy, management, economics and sociology, in which scholars operate within their chosen communities of practice (Lave and Wenger, 1991), cultures, disciplines and organizations.

Communities of practice, cultures, disciplines and organizations can themselves be considered as systems, separated by socially-constructed boundaries which are established by judgements concerning who or what should be included in their scope. Boundary judgements delimit systems based on factual observation and evaluation, while changing observations and evaluations produce new boundary judgements (Ulrich, 2000). When separate sub-systems (for example, various levels of government, science, research, industry and community interest) act together in pursuit of their individual and collective goals, they form complex governance systems, delimited by boundary judgements that result in the inclusion or exclusion of component systems at various scales and levels (Termeer *et al.*, 2010). Teisman *et al.* (2009) present a series of studies that focus on the dynamics, self-organization and coevolution of complex governance systems

*Ludwig von Bertalanffy's general system theory (von Bertalanffy, 1950) is widely acknowledged as a seminal contribution to the development of systems theory and its application to physical and social phenomena.

in the context of large civil infrastructure projects, such as the deepening of the Unterelbe estuary in Germany in order to maintain shipping access to the port of Hamburg (van Gils *et al.*, 2009). In considering this case, Gerrits *et al.* (2009) highlight the interactions between a physical or natural system (the Unterelbe), a social system (the communities involved or affected) and a policy action system (the initiating and controlling authorities), noting the provisional, unpredictable nature of the complex governance system that emerges from the interactions. These authors provide us with the term 'policy action system', to describe the organizational unit that is often synonymous with the project and responsible for its delivery.

We can understand projects in many policy arenas as policy action systems, with appropriate qualifying adjectives. The Unterelbe project would thus be a *public infrastructure* (policy) action system. We can regard public research projects, by analogy, as *knowledge-action* systems in which research practitioners engage in instrumental relationships with the physical, natural or social systems they seek to understand or control. The term 'knowledge-action system' is already used in reference to 'the networks of actors involved in the production, sharing and use of policy-relevant knowledge' (Muñoz-Erickson, 2014). We are therefore confident in recruiting the concept of the knowledge-action system to bind together projects and project organizations (Ratcheva and Simpson, 2011) as units of policy-relevant knowledge production. Ratcheva and Simpson (2011) draw on the theory of the temporary organization (Lundin and Söderholm, 1995) to make the distinction between enduring *project-based organizations* (such as construction firms, or university research groups) which use projects as a way of working, and true *project organizations* (such as 'one-off' feature film production companies or governmental public enquiries), where the project organization and its project are one and the same thing. We can now refine our understanding of Braun's (2003) 'delegation to networks' scenario by recasting it as the assignment of public value projects to project organizations. The project organization and its project can be considered a knowledge-action system in its own right or as a component of a larger knowledge-action system. These reflections allow us to locate our network activities, as scientists and managers, in knowledge-action systems. We must act within these complex governance systems to provide the management responses necessary to progress our projects. The nature of the management response to network governance is considered in the next section.

Boundary organizations, the management response to network governance

The studies discussed by Teisman *et al.* (2009) reveal the importance of flexibility in the management response to complex systems governance, noting that the policy action system must deal with emergent governance by working across multiple system boundaries. Many authors—for example, Cash *et al.* (2003) and Muñoz-Erickson (2014)—refer to this kind of flexible management response as 'boundary work'. The idea of boundary work was introduced by Gieryn (1983) to describe how scientists distinguish between science and non-science, while boundary objects (Star and Griesemer, 1989) and standardized packages (Fujimura, 1992) were conceived as objects or artefacts that enable understanding and co-ordination of practices among diverse communities and disciplines. Guston (1999) later institutionalized boundary work in the concept of the 'boundary organization'. Government laboratories, institutes and centres are described by Gulbrandsen (2011) as boundary organizations which span boundaries between the public and private spheres, while Etzkowitz and Leydesdorff (2000) note the emergence of hybrid organizations that facilitate the 'triple helix' relations of government, academia and industry. Government agencies and universities can also be regarded as boundary organizations. Funding agencies and research councils mediate between the policy and academic systems, under the steering influence of both, while universities are subject not only to the traditional co-governance of their academic communities but also to the bureaucratic intervention and influence of government and other stakeholders (Bleiklie and Kogan, 2007). The distinguishing feature of boundary organizations is that their governance stimulus is not drawn from a single stakeholder, but from a multi-stakeholder coalition within which, as Koppenjan and Klijn (2004) put it, 'pushing and pulling takes place regarding the prioritization and formulation of problems and the way they should be solved'.

Early studies of boundary organizations placed them at the intersection of abstract, high-level governance systems such as those of the public and private sectors (Gulbrandsen, 2011), science and politics (Drimie and Quinlan,

2011), or government, industry and academia (Etzkowitz and Leydesdorff, 2000). However, it is clear that many system scales, and scale levels can be juxtaposed (Cash *et al.*, 2006), allowing a multi-stakeholder perspective to be adopted (Parker and Crona, 2012). The latter authors construct a model of boundary management to illustrate how a university-based centre can flexibly address the needs and contributions of multiple interest groups during the course of its mandate. The adaptive management response does not, in our view, depend on formal recognition of such a centre as a boundary organization, but is the normal response of any organization acting in a complex governance environment. There is a sense in which every individual, group, organization, or project is a boundary organization that both influences, and is influenced by, myriad systems of personal and professional identity and action. The complex systems approach we have been taking does not require the deployment of boundary organizations as formal mediators between otherwise separate systems. Rather, boundary organizations arise as natural components of complex action systems, where there are no 'bright lines' between the parts. We conclude that we can use the powerful metaphor of the boundary organization to inform our practice, as central actors in project organizations.

Being conscious of our project organizations as boundary organizations allows us to position them in relation to network governance dynamics. These dynamics will inevitably cause our management response to deviate from the path intended by the project initiators, drawing us into the 'continuous process of negotiation' (Parker and Crona, 2012) required to reconcile the evolving expectations of our salient stakeholders. Of course, we can choose to minimize 'mission creep' by avoiding or delaying the governance input of stakeholders whose interests are deemed (by boundary judgement) to be outside, 'downstream', too costly to address, or otherwise distracting to our project. This conservative approach can be an effective way of getting simple projects running on time and on budget, but failure to identify and engage salient stakeholders early is a recipe for failure in more complex undertakings. On the other hand, a project that is open to an unlimited range of governance inputs will benefit from new connections and insights, but risks descent into chaos 'when too many actors in a system go about their activities in a dissipative fashion, looking for synergy but without the ability to realize their own ambitions, let alone collective ones' (Buijs *et al.*, 2009). Overall, the management response must strike a balance between planned and contingent process management (Edelenbos *et al.*, 2009) and between stakeholder relationships of control and trust (Edelenbos and Eshuis, 2009). As their governance dynamics unfold, projects can evolve as communities of practice (Wenger *et al.*, 2002) moving through a series of transformations, with existing and new individuals and institutions joining, leaving, or taking on more or less influential roles. We are left with a compelling vision of knowledge-action systems as matrices of project organizations and their projects. Together, these are assumed to secure the 'salience, credibility and legitimacy' (Cash *et al.*, 2003) of policy-relevant knowledge.

Synthesis and conclusion: valuing research projects

Our quest for circumstance-contingent theory to inform our stewardship roles in collaborative research has led us to use the lens of complex systems governance to focus on delegation of public projects to networks. The insights gained allow us to locate our research collaborations and projects in knowledge-action systems which are themselves examples of policy action systems. Our engagement in policy action adds the role of 'public manager' to our existing repertoire of identities. We may prefer to think of ourselves as scientists, and to assume that our networks and projects are 'all about' science, but it is sobering to reflect that we merely represent the 'scientific-managerial epistemic culture' (Muñoz-Erickson, 2014) within an evolving and complex knowledge-action system. The knowledge-action systems analysis (KASA) framework introduced by Muñoz-Erickson (2014) makes it clear that it is possible to objectively map such systems, identifying their 'real' central actors, exploring alternative future visions and assessing the influence of different epistemic communities and boundary judgements on system outputs and outcomes. The only addition to Muñoz-Erickson's (2014) framework that we suggest is the recognition of network-governed research projects as salient knowledge-action system components. Before advancing our argument for such recognition, we need to briefly review the status of research as an epistemic culture distinct from those of science or other academic disciplines.

The emergence of 'industrialized science' (Ravetz, 1971), and of research groups as 'quasi-firms' (Etzkowitz, 2003) herald the conversion of research from a neutral process of enquiry,

accessible to all, into a culture capable of extending 'science's claim to truth and certainty' (Latour, 1998). Valid or not, this view of research has prevailed at policy level, and it is currently important for academics to adopt the additional identity of 'researcher' in order to access scarce global funding. Academic institutions fulfill their supporting role as boundary organizations by declaring themselves to be 'research universities' playing host to publicly-funded research networks, projects and centres, and jostling to stake reputational claims in the new world of research. Externally-funded research networks, projects and centres are treated as ceremonial entities, as noted by Krücken *et al.* (2007) in the case of university technology transfer offices which are set up to accommodate policy expectations, but have limited impact on core academic practices. The fact that delegation of research to networks involves co-production of thoughtful, peer-reviewed project proposals—and is therefore not 'blind delegation' (Braun, 2003)—tends to be lost in the rush to convert proposals into money in the form of grants and awards. It is as if researchers receive two valuable gifts wrapped up in the public project—its collective governance rights, and its funding—but retain only the funding and apply it to the private (if no less worthy) projects essential to their academic interests and careers. Researchers and their institutions thus abandon their governance interest in the delegated knowledge-action system represented by the public project, which then recedes into the administrative hinterland. This behaviour is rewarded by research evaluation systems which focus on the 'impact' of published research. The success or failure of the public projects that networks are empowered to perform is rarely evaluated. This represents a kind of reverse-engineering, in which delegation of research to networks is converted back into the blind delegation (Braun, 2003) of an earlier era of disciplinary science. We conclude that, as central actors in the knowledge-action system, we need to provide a management response not only to the well established scientific-managerial epistemic culture, but also to acknowledge the existence of a more complex, 'researcher epistemic culture'. The management response to the latter is heavily dependent on our understanding of networks, complex governance systems and boundary organizations.

It is perhaps surprising that the potential of the public research project as an organizational arrangement designed to deliver public value can go unrecognized by policy-makers, funders and academic institutions. An obvious solution to the 'invisibility problem' would be to privilege projects as key components of knowledge-action systems, and to fund and evaluate their performance accordingly. We believe that this is the policy intent of Braun's (2003) 'delegation to networks' scenario, albeit one which needs to be signalled more clearly to academic communities intent on grasping funding opportunities. A further signal is needed to correct the misperception of research projects as transient constructs, when in fact it is their grant funding, and their networks of governance actors, that are transient. Projects and project artefacts are potentially immortal, and can be accessed, maintained, extended, revised and re-used indefinitely within knowledge-action systems. The many projects that fail to receive funding in their first iteration can be used as a source of 'floating' proposals (Rip, 2000), available for future funding by a variety of sponsors. Similar projects, and projects in adjacent fields of scholarship, can be joined up by 'coherent programming' (Murphy-Bokern, 2012) to address the so-called grand challenges of society. Researchers can develop their careers in series of related projects, building *latency* (Starkey *et al.*, 2000) in the form of relationships, skills and creative ideas that can be used in future projects.

An important advantage of privileging projects lies in the fact that they are naturally collaborative and non-disciplinary, involving a potentially unlimited range of epistemic cultures in co-production of knowledge and learning. The epistemically neutral nature of projects resolves the tensions inherent in the simultaneous conduct of discipline-based academic careers and project-based research careers, by accepting that these career trajectories are informed by separate epistemic cultures that can nevertheless be accommodated as the 'warp and weft' of the knowledge-action fabric. The neutrality of projects presents a further opportunity for universities and their staff—by which we mean all members of the academy, irrespective of divisive classifications as academic, professional or 'support' staff—to deliver public value. Universities, and in particular their libraries and information and data repositories, are well positioned as boundary organizations to support the collective ownership and management of project-derived knowledge within the 'knowledge commons' (Hess and Ostrom, 2011).

All of the opportunities listed above are accompanied by challenges of implementation

that will require further reflection and attention to new strands of scholarly discourse. Challenges include those of quality control, regulation, peer review and funding of research that is no longer explicitly tied to disciplinary structures. Understanding and exploiting the dynamic, deliberative nature of governance networks demands boundary management skills of the highest order from their central actors. Not all system actors will choose to rise to these challenges, but those that do will enjoy comparative advantage in delivery of public value through collaborative research.

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IMPACT

The delegation of research to self-directed networks involves policy-makers, knowledge producers and knowledge users in co-governance and management of public value. Network-governed projects can be managed as boundary organizations or as communities of practice which continually adapt to the dynamics of their governance environment. Recognizing and supporting projects as components of enduring knowledge-action systems, rather than simply as transient instances of funded research, allows policy-makers and managers to build knowledge and learning at a scale that matches the societal grand challenges they seek to address.